Claims

What is claimed is:

1. A method for calculating the reciprocal square root of a number, comprising the steps of:

forming a piecewise-linear estimate for the reciprocal square root of a number;

rounding said estimate to a lower precision;

computing the residual of said rounded estimate;

using a Taylor Expansion to compute the polynomial in said residual of said estimate to obtain the residual error; and

multiplying said rounded estimate by said residual error and adding the result to said rounded estimate.

2. The method of claim 1, said estimate is rounded to one half the number of digits sought for the final result.

3. The method of Claim 1, wherein said estimate is rounded to less than one half of the number of digits sought for the final result.

4. An apparatus for calculating the reciprocal square root of a number, comprising:

an arrangement for forming a piecewise-linear estimate for the reciprocal square root of a number;

an arrangement for rounding said estimate to a lower precision;

an arrangement for computing the residual of said rounded estimate;

an arrangement for using a Taylor Expansion to compute the polynomial in said residual of said estimate to obtain the residual error; and

an arrangement for multiplying said rounded estimate by said residual error and adding the result to said rounded estimate.

5. The apparatus of Claim 4, wherein said estimate is rounded to one half the number of digits sought for the final result

6. The apparatus of Claim 4, wherein the said estimate is rounded to less than one half the number of digits sought for the final result.

7. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform a method for calculating the reciprocal square root of a number, comprising the steps of:

forming a piecewise-linear estimate for the reciprocal square root of a number;

rounding said estimate to a lower precision;

computing the residual of said rounded estimate;

using a Taylor Expansion to compute the polynomial in said residual of said estimate to obtain the residual error; and

multiplying said rounded estimate by said residual error and adding the result to said rounded estimate.

8. The program storage device of Claim 7, wherein said estimate is rounded to one half the number of digits sought for the final result.

9. The program storage device of Claim 7, wherein said estimate is rounded to less than one half the number of digits sought for the final result.